State of California
AIR RESOURCES BOARD

Small Off-Road Engine Evaporative Emission System Components

Executive Order Q-12-001

DSM Engineering Plastics
Innovative Product

WHEREAS, Pursuant to California Health and Safety Code (CH&SC), sections 39600, 39601, and 43013, the California Air Resources Board (ARB) has established a certification process for evaporative emission system components designed to control gasoline emissions from small off-road engines, as described in California Code of Regulations (CCR), title 13, section 2767.1;

WHEREAS, Pursuant to CH&SC, section 43013, ARB has established criteria and test procedures for determining the compliance of evaporative emission system components with the design requirements in CCR, title 13, section 2754;

WHEREAS, Pursuant to CCR, title 13, section 2767.1, ARB Executive Officer may issue an executive order if he determines that the small off-road engine evaporative emission system component or innovative product conforms to the applicable performance requirements set forth in CCR, title 13, section 2754 and 2755;

WHEREAS, Pursuant to CH&SC, sections 39515 and 39516, ARB Executive Officer issued Executive Order G-05-008 delegating to the Chief of ARB Monitoring and Laboratory Division (MLD) the authority to certify small off-road engine evaporative system components and innovative products; and

WHEREAS, On January 17, 2012, DSM Engineering Plastics submitted an application for certification as an innovative product under CCR, title 13, section 2767(c) for Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks.

NOW, THEREFORE, I, Alberto Ayala, Chief of MLD, find that fuel tanks produced using DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin material and following the process and material specifications set out in Attachment A constitute innovative fuel tanks pursuant to CCR, title 13, section 2767(c). Fuel tanks produced following DSM Engineering Plastics process and material specifications are hereby deemed equivalent to those tanks listed in CCR, title 13, section 2752(a)(5). This finding is based on DSM Engineering Plastics demonstration that such fuel tanks have a permeation rate substantially lower than 1.5 grams per square meter per day set forth in CCR, title 13, section 2754, when tested at a constant temperature of 40° C pursuant to alternative test procedure ATP-10-001 using an approved test fuel of CE10 certified fuel.

IT IS ORDERED AND RESOLVED that no tank permeation data is required to be submitted in the certification process for equipment using the DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks.

IT IS ORDERED AND RESOLVED that all fuel tanks made from DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin with minimum barrier and nominal wall thicknesses equal to or greater than the value listed in Table 1 incorporated herein, are certified for use in small off-road equipment.

Table 1
Specifications for DSM Engineering Plastics Akulon® Fuel Lock FL40-HP Resin for Fuel Tanks

Minimum barrier thickness (mm)	Nominal overall tank thickness (mm)
1.2	1.6

IT IS FURTHER ORDERED that DSM Engineering Plastics shall provide a warranty to equipment manufacturers purchasing their Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks. The warranty must conform to the requirements of CCR, title 13, section 2760.

IT IS FURTHER ORDERED that the certified Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks shall be installed in accordance with the manufacturer's installation and use instructions for the tanks. A copy of this executive order and the fuel tanks' installation and use instructions shall be provided to manufacturers purchasing DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks for installation on small off-road engines and equipment introduced into commerce in California.

IT IS FURTHER ORDERED that DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks shall be clearly identified by a permanent identification that allows ARB to identify manufacturer's name, executive order number, and model number.

IT IS FURTHER ORDERED that any modification of DSM Engineering Plastics approved process and material specifications for producing Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks is prohibited. Any alteration or modification of the process or material specifications set out in Attachment A of this Executive Order will require the manufacturer to apply for a new executive order.

IT IS FURTHER ORDERED that the DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks shall be compatible with fuels in common use in California at the time of certification and any modifications to comply with future California fuel requirements shall be approved in writing by the Executive Officer or Executive Officer's delegate.

IT IS FURTHER ORDERED that the innovative product certification of the DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks can be referenced in certification applications for small off-road engines and equipment that use small off-road engines unless the Executive Officer finds that the DSM Engineering Plastics Akulon® Fuel Lock FL40-HP resin for extrusion or injection blow molded fuel tanks no longer meets the performance requirements set forth in CCR, title 13, section 2754, when tested pursuant to CCR, title 13, section 2765.

Executed at Sacramento, California, this 8th day of February 2012.

Alberto Ayala, Ph.D., M.S.E.
Chief, Monitoring and Laboratory Division

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Request for Innovative Product Executive Order
Akulon® Fuel Lock FL40-HP

Attachment A

Akulon® Fuel Lock FL40-HP
Blow Molding Processing Conditions

1.1 Pre-drying conditions

Moisture in Akulon Fuel Lock can lead to reduced melt strength and to reduced surface appearance, like bubbles. Pre-drying is also recommended for recycle material or re-grind material, if not used directly. Drying conditions:

Drying time [hr]	Temperature [°C]	Remarks
4-8	80	✓ Maximum moisture content will be 0.1% ✓ Pre-drying will enhance processing performance and reduce discoloration at temperatures below 80 [°C]

If processed as prescribed, up to 50% of recycle material (re-grind), can be processed without loss of quality.

1.2 Processing temperature

The melt temperature mainly effects processing behavior via the viscosity and the color. A too high processing temperature results in a decreased melt strength and can result in discoloration (yellowness). Recycle of material that was processed at a too high temperature is not recommended.

The mould temperature can be set in a range between 15 and 80 °C. No/limited impact of the mould temperature can be expected on the pinch line or the part surface when processing Akulon Fuel Lock. The mould temperature can be optimized to tune the result in surface quality and/or should be taken into account considering the design.

Profiles	Feeding zone [°C]	Extruder profile [°C]	Die head [°C]	Mould [°C]
Profile 1	100 – 180	240 – 270 increasing	245 - 270	15 -80
Profile 2	250	250 – 260 flat	245 - 270	15 -80

Executive Order Q-12-001, Attachment A